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# THE GEOGRAPHICAL REVIEW

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## THE GREAT RUSSIAN RETREAT<sup>1</sup>

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The two most important military developments in 1915 were the Russian retreat from the heights of the Carpathians to the Pripet marshes and the conquest of Serbia by the Teutonic allies. In the present article attention is directed to the first of these movements with the object of illustrating the strategic value of landforms to the Russian armies during one of the most skilfully conducted retreats in military history.

*General Geographic Relations.* A map (Fig. 1) of the area covered by the retreat will enable us to appreciate some of the broader geographic problems involved in this great movement. First, let us note the position of the Russian armies on the last day of April, 1915, when the German guns along the Dunajec and Biala Rivers opened the campaign which was to drive the Slavs back across a belt of country measuring more than 250 miles in maximum width. From the Baltic Sea north of Memel the defensive line of the Russians ran eastward toward the Dubissa River, thence southward along or near that stream to its junction with the Niemen. Beyond this point the Russians had been able to advance from behind their main protective screen of the Niemen-Narew barrier of river and marsh and hold the Germans at bay in the swampy forests farther west. South of the Vistula the Russians remained secure behind the almost continuous trench formed by the valleys of the Bzura, Rawka, Pilica, Nida, Dunajec, and Biala Rivers. Near Cieżkowice on the last named stream the Russian line left the valley and, turning southeast over the foothills, crossed the main crest of the Carpathian Mountains and followed their southern slope eastward beyond the Lupków Pass. Recrossing thence to the north side of the range, the line followed the Stryj valley toward its junction with the Dniester and the northern side of the Dniester gorge to the Rumanian border.

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<sup>1</sup> This is the sixth in a series of articles on the geographic aspects of the war, which appeared in the *Bull. Amer. Geogr. Soc.*, Vol. 47, 1915, pp. 175-183, 265-277, 358-361, 442-444, and 526-529, respectively. For a further account of the topographic features described but briefly in the present article, the reader should consult the second paper of the series.

To state the position of this great battle front is alone sufficient to emphasize the importance of river, marsh, mountain, and gorge as defensive screens against enemy attacks. Even where the Russian line was not immediately associated with some striking topographic barrier, as for example the segment between the Niemen and Vistula Rivers, the main defensive position was usually along such a barrier but a short distance in the rear of the actual front. The Teutonic armies had for months been facing the series of obstacles named above, and repeated furious assaults against first one barrier and then another had ended in failure. What was there back of the barriers for which the Teutonic armies were fighting so strenuously, how did these armies finally break through the opposing obstacles, and to what extent were they successful in achieving the purposes for which they fought? Let us see what points of geographic interest are involved in the answers to these questions.

Back of the artificially entrenched and naturally protected Russian line lay Warsaw, a fortified city guarding one of the few bridge crossings of the Vistula, a railway center of the highest importance, and a political prize of the first magnitude, for the capture of which the German generals in repeated drives had vainly sacrificed hundreds of thousands of their best troops. Two direct assaults on the city failed, the first almost at the city gates, the second at the defensive line of the Bzura and Rawka Rivers. There remained the possibility of isolating the city and forcing its surrender by severing its railway communications. It will be seen from the map (Fig. 1) that Warsaw forms the apex of an important system of railways converging westward from all parts of the Russian Empire. For the sake of simplicity the most important lines alone are represented, and of these the line from Petrograd through Dvinsk, Vilna, Grodno, and Bielostok, and the lines from the east and south passing through Brest-Litovsk, Kovel, and Ivangorod were absolutely essential to the defense of Warsaw and to the supply and munitionment of the main Russian defensive positions which these railways paralleled for long distances. Repeated attempts to sever the railway southeast of Warsaw ended in failure when the Austrian armies were defeated in their endeavor to advance through the marshy forests south of Lublin and Cholm early in the war and the Austro-German armies vainly attacked the great trench of the middle Vistula River. Similar attempts against the Petrograd-Warsaw line failed because the Germans were unable to cross the middle Niemen between Kovno and Grodno or the Narew-Bohr line of river and marsh farther southwest.

The Teutonic armies were sadly in need of a position for the coming winter which would have immediately behind and parallel to it a good railway line. This would enable them to shift their gradually decreasing supply of troops from point to point with the rapidity necessary to meet an enemy offensive or to bring overwhelming numbers to some particular

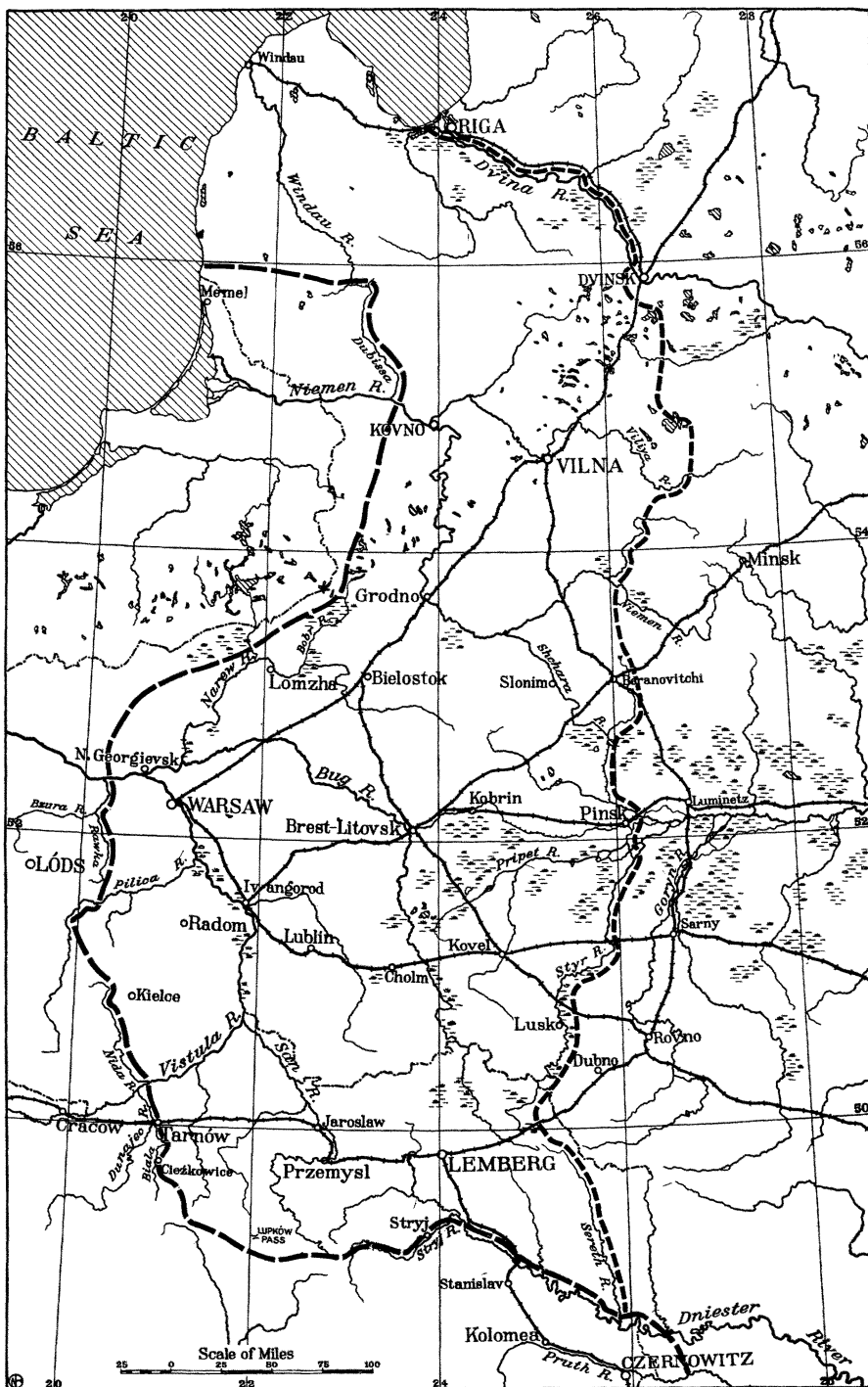


FIG. 1—General map showing the extent of the Russian retreat. Long dashes show the Russian position in April, 1915; short dashes, the position at the end of the retreat. Scale, 1:5,700,000.

point where a Teutonic offensive was contemplated. It would also permit the munitionment of their troops so rapidly as to give them a great superiority in artillery duels. At the same time the Russian loss of the railway would decrease the mobility of their armies and place them at a fatal disadvantage in bringing to their front supplies of all kinds. If the railway loop Vilna-Bielostok-Warsaw-Ivangorod-Lublin-Kovel-Rovno could be broken near its apex and the fortifications of Warsaw and Ivangorod taken, the Russians would be forced back to the loop Vilna-Bielostok-Brest-Litovsk-Kovel-Rovno. The Austro-German armies then might hope to break the apex of this blunter loop at Brest-Litovsk and so push on to the nearly north-south line through Riga-Dvinsk-Vilna-Baranovitchi-Luminetz-Sarny-Rovno and its continuation to Lemberg-Kolomea-Czernowitz. Entrenched on the eastern side of this great line of steel stretching unbroken from Riga on the Baltic coast to Czernowitz near the Rumanian border the Teutons could bid defiance to the Russians operating at the isolated ends of widely separated railways in a difficult country where neither railways nor good wagon roads paralled their extended front.

But far more important than any of the above-mentioned prizes back of the Russian line was the Russian army itself. Wars are won by destroying the enemy's fighting forces, not by winning cities, railways, and good defensive positions. In the retreat which would follow the forcing of the Russian line the Teutons hoped to surround and destroy large sections of the Czar's armies. Unless this principal object of warfare was achieved, the other gains might not repay the fearful cost of a great general offensive.

We must not lose sight of one further prize of a political nature for which the Teutons were contending, for political events may profoundly influence or even determine military campaigns. Back of the Russian line lay the Balkan states, politically if not geographically. An Austro-German victory involving the conquest of Poland would profoundly impress the wavering Balkan monarchs and might bring one or more of them into the fight on the Teutonic side. Russia herself might be so sorely bruised as to forsake her allies and conclude a separate peace. Failing this, the Russian armies could at least be temporarily paralyzed, thus permitting the transfer of large bodies of Austro-German forces from the eastern theater of war to the Franco-British and Italian fronts, where their aid was sorely needed. From the military standpoint the possible results of a great Teutonic offensive certainly justified expenditure of the hundreds of thousands of men already sacrificed in earlier endeavors to break through the topographic barriers protecting the Russian railways and the great hosts of Austro-German troops which would undoubtedly perish in renewed attempts to achieve success.

Why was it that the Russian position along the eastern wall of the Dunajec and Biala valleys, protected by a natural moat of such formidable character that Teutonic armies had suffered repeated defeats in earlier

efforts to cross it, was finally broken by the assault which began the last of April? The answer to this question is largely geographical, and to appreciate it the reader should turn to a map of Eurasia showing principal railway lines. It will there be seen that Russian communication with the outside world is effected mainly through the five following routes: westward through the Baltic, or by way of Austrian and German railways across central Europe; eastward by the Trans-Siberian railway to the sea-coast opposite Japan; southward through the Black Sea and Dardanelles to the Mediterranean; and northward through Archangel to the Arctic Sea. The roundabout rail connection with Scandinavian ports, involving transshipment of goods across a gap of several miles at the Russo-Swedish border, and the route, no longer available, up the Danube to the Nish-Saloniki railway and so out to the Mediterranean, are neither one sufficiently satisfactory to be reckoned among the principal trade routes of the Russian Empire, although both have served a useful purpose and the former is being rapidly improved. Since Russia is not a great manufacturing country and some of her most important munition factories have been destroyed by German spies, the supplies for her artillery must come largely from the outside world through one or more of the five routes just mentioned. But the German fleet and German mines close the Baltic outlet; Austro-German armies bar the way to the Austrian and German railways; the Turkish forts at the Dardanelles still control the exit from the Black Sea; and through the long winter of 1915 Arctic ice sealed the only port on the northern coast.<sup>2</sup>

There remained the single railway, many thousands of miles in length, connecting the hungry cannon of the Russian front with the munitions factories of Japan. When one considers how seriously is regarded the loss of a single railway from among the complex network of lines serving a short segment of the western battle front in France, one can perhaps appreciate the serious condition which confronted the Russian armies when a battle line nearly a thousand miles long became largely dependent on a single railway for its artillery supplies. This condition became known to the Teutonic commanders, who concentrated a large quantity of guns and munitions along the Dunajec-Biala front for a vigorous offensive. April 29 or 30 saw the opening of the campaign with a terrific artillery duel which lasted two days. Then the Russian field guns grew silent. Artillery supplies were exhausted and rifle ammunition greatly depleted. Troops which had easily held the Teutons at bay before the surrender of Przemyśl released 250,000 of their comrades to help them in this task, now fell back in spite of the reinforcements because their guns had been starved all winter; because a single line of railway could not supply a thousand miles of battle front, especially after Japan's complications with China had reduced the shipments of Japanese munitions.

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<sup>2</sup> For an account of what Russia has done to overcome her isolation, see the article in this number entitled "Russia's War-Time Outlets to the Sea."

To what extent did the Teutonic offensive achieve its purposes? Warsaw was captured, Poland conquered, and a part of the railway system controlled. Bulgaria was influenced to join the Teutons, and the conquest of Servia thus made possible. A glance at the map (Fig. 1) shows that control of the great north-south railway system from Riga to Czernowitz was not secured, for the Russians still possess two great segments of the line. From Riga to Dvinsk the Dvina River and its marshes have proven an impassable barrier to the Teutonic forces; from Baranovitchi to the Galician border the Shchारा, Pripet, and Styr Rivers, a connecting canal, and the Pinsk marshes stand between the exhausted Teutons and their objective. The much-coveted winter position was not secured by the Teutonic armies, and no satisfactory position is now available to them without an extensive withdrawal of parts of their line. Both Slav and Teuton lost heavily in men, but no part of the Russian army was surrounded and destroyed. The primary object of every war was not achieved by the offensive, and the Russian armies at the end of the great retreat, instead of being broken and demoralized, were able to take up defensive positions behind topographic barriers in an orderly manner and to beat back their pursuers along parts of the line with smashing blows. Assault after assault at the northern end of the line has profited the Germans nothing; while an advance of the Russians in Galicia has cost the Austrians heavily in killed and captured. No opportunity has been afforded the Teutons to detach large bodies of their troops from the eastern front for service in the west or against Italy. Russia, instead of being ready for peace, has been preparing a new offensive against the Teutonic line.

The attempts of the Teutonic armies to envelop and destroy some portion of the Russian forces involved the creation of several dangerous salients in the Russian line, followed by an endeavor to close the neck of each salient by attacks from both sides and so to isolate the armies forming its apex. The campaign in Galicia drove the Russian left wing eastward to the Bug and Złota Lipa, thereby creating the great Warsaw salient. Incidental to this campaign was the creation of an important salient at Przemyśl. After the Warsaw salient had been straightened out by the withdrawal of the Russian center to the line of the Bug, the salients of Grodno and Vilna were in turn developed. The great retreat ended with the unsuccessful German attacks against Riga and Dvinsk. The rôle of landforms in the Galician and Riga-Dvinsk campaigns, and their skilful utilization by the Russian commanders in extricating their armies from every salient, form the subject of the following pages.

*The Galician Campaign and the Przemyśl Salient.* The attack on the Dunajec-Biala line, which began the Galician campaign the last of April, was directed against the whole of this front; but, according to report, with especial vigor against Cieżkowice, where the lines of trenches left the

Biala River to cross the hills toward the Carpathian crest (Fig. 2). Assuming the truth of the report, it is not difficult to understand why the locality mentioned should be a point of weakness in the Russian line. As described in an earlier article, both the Dunajec and Biala valleys are fairly open, flat-floored trenches with steep sides, which, with the streams meandering through them, form a natural moat of formidable proportions behind which the Russians had long maintained themselves in security. The function of these troops was to hold the Teutons at bay west of the moat, in order to protect those arteries of communication which extended from the main railway in the Tarnów-Jaroslaw lowland, up the northward-draining valleys to the Carpathian crest, through the Dukla, Lupków, and other passes, and so to the Russian front south of the main ridge. Failure of munition supplies rendering the defending troops impotent longer to perform their function, the first break in their line might well have been expected toward the south where the natural trench of the Biala is smaller and the line of artificial trenches left its protection for a more southeasterly course. It is not surprising, therefore, that the southern end of the Dunajec-Biala line was bent back with comparative rapidity, whereas the northern end, near Tarnów and beyond, did not abandon its defensive position until about a week later.

A branching river system in a mountainous district has one serious disadvantage as a means of supplying an army front located near its headwaters. The supply lines for many miles of front must follow the courses of the upper tributaries of the trunk stream, since communication across the intervening mountain ridges is impossible. An enemy may therefore cause the precipitate retreat of a long segment of the fighting line stretched across a series of converging tributaries by threatening to capture a few miles of the trunk valley. It was for this reason that the Russian front south of the Carpathians abandoned the hard-won mountain passes and fell back to the north and east, when the weakening of their comrades' hold on the Dunajec-Biala trench jeopardized the supply line in the Wislok and Wisloka valleys.

The slow retreat of the northern end and the more rapid retreat of the southern end of the Russian line in west Galicia was significant in several respects. That part of the Russian line just north of the Vistula trench could retreat but slowly through the dissected upland of southern Poland, and would have been exposed to a flank attack from the south had their comrades back of the lower Dunajec been forced eastward so rapidly as to leave a gap between the two parts of the line. The defensive value of the broad Dunajec valley was doubtless important in insuring a retreat south of the Vistula at a rate which would permit maintenance of an unbroken front with the slow-moving troops to the north. On the other hand, the rapid retreat at the extreme south made impossible any simultaneous alignment of the entire west Galician army back of the Wisloka or Wislok trenches during the retirement. Toward the end of the first week in May the Russian line



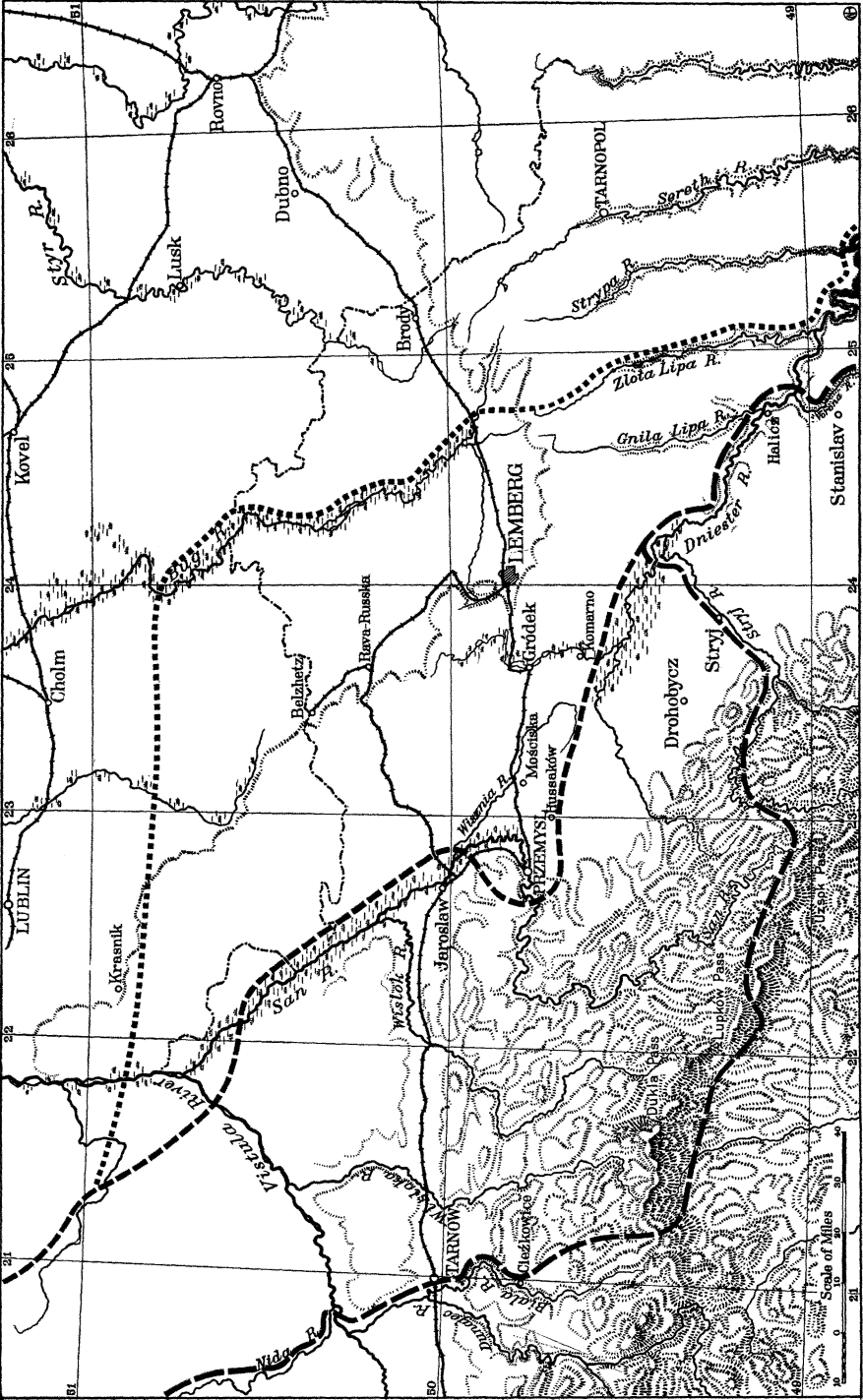


FIG. 2.—Topographic features of the Galician region. Long dashes show the Russian position at the beginning of the retreat; short dashes, position back of the San-Dniester marshes; dots, position behind the Bug-Zlota-Lipa-Dniester barrier. Scale, 1:2,300,000.

was behind the upper Wisloka trench toward the south but cut across country to the lower Dunajec farther north. A few days later it was back of the upper Wislok at the south, whence it cut across the hills to continue for some distance along the east side of the lower Wisloka. Not until the middle of May was the Russian line fairly well straightened out back of a continuous topographic barrier of the first importance, the San-Dniester belt of river and marsh. The character of this belt and its great importance as a defensive screen in earlier campaigns have been described in former articles. As will appear from the map (Fig. 2) there is a narrow isthmus of dry land between the San marshes and the marshes of the upper Dniester. Hussaków stands near the center of this strategically important land gateway, while a small stream, the Wisznia, does its best to close the gap and make the San-Dniester barrier complete. From behind this most formidable river barrier in Galicia the Russians administered the first serious check to the great Teutonic offensive.

At this time the Russian front departed from the line of the barrier in three places. Toward the north Russian troops were able to check the Teutons before retreating as far east as the San and Vistula and were subsequently successful in a temporary advance in that region. Far to the southeast the forces of the Czar had emerged from behind the deep trench of the lower Dniester and, pushing the Austrians before them, had advanced to the line of the Pruth (Fig. 1), where they established themselves behind the defensive screen of that river. The third peculiarity of the line was at Przemyśl, where the line encircled the city to protect the removal of stores, munitions, and guns prior to its inevitable surrender to the enemy. This was the famous Przemyśl salient, the first of four to be developed during the Russian retreat. It is the one in which topographical features seem to have played the least striking rôle.

The line defending Przemyśl followed a curved course over the adjacent foothills of the Carpathians and doubtless profited by the partially reconstructed fortifications earlier captured from the Austrians. On the south it stretched across the dry-land bridge past Hussaków, protected by no topographic barrier of importance. To close the neck of this salient and capture the portion of the line thus isolated, together with the vast quantity of military stores and guns remaining in the city and its forts, the Teutons fought one of the hardest battles of the Galician campaign. As the attack from the north would be hindered by the position of the San marshes, we should expect the Teutonic armies to concentrate their most strenuous efforts in an attempt to push northward from the vantage ground of the more favorable topography about Hussaków. This is apparently what occurred. Beginning the middle of May, one smashing assault after another was delivered against the Russian line at Hussaków, and at Lutków a short distance east. Day after day, for a week or more, these assaults continued. The neck of the salient was only twelve miles wide, or

but six miles from either side to the railway over which the Russians were ceaselessly shipping the contents of Przemyśl to Lemberg and the east. Austrian and German guns dropped occasional shells on the railroad; but the work of evacuating the city continued with little interruption until all the stores, munitions, and big guns were safely removed. Then the Russians, leaving a small rearguard to cover the movement, withdrew their main forces to the line of the Wisznia, thus straightening out the Przemyśl salient. The first decisive attempt to envelop and destroy a large segment of the Russian line had failed, probably because the barriers of river and marsh in front of other parts of the line could be held with sufficient ease to permit a large concentration of troops at the Hussaków gateway to meet and defeat the main Teutonic attack.

The Galician campaign could not proceed until the Russians were dislodged from behind the San-Dniester barrier. As was expected, the first blow for this purpose was delivered near Jarosław; for the Cracow-Jarosław lowland was the natural groove along which the Teutonic bolt could be fired with the greatest speed. It struck the San about May 14; lost momentum as it passed through river, marshes, and muddy slopes; and finally stuck fast on the opposite bank May 17. Meanwhile the operations against the Przemyśl salient had begun. When the Russians surrendered the empty city about June 1 and withdrew to the Wisznia line, Mościska, near the center of the Wisznia barrier, bore the brunt of repeated assaults.

Unable to penetrate the natural defensive screen in this region, the Teutons sought for success farther south. The marshes of the upper Dniester made a general offensive against that part of the line out of the question, while the gorge of the lower Dniester had long proven an impassable barrier to the Austrians. The point selected for the next attack was therefore Zurawno, beyond the lower end of the great Dniester marshes, but above the beginning of the deep gorge. Although not on a railroad, Zurawno was chosen because its favorable physiographic situation more than compensated for the absence of direct railway communication. A violent assault carried the Teutons across the river June 6; but once more the difficulty of quickly transporting heavy guns and large supplies of bulky munitions across a river with deep channel, muddy floodplains, and slippery banks brought the forward movement to a speedy end; and a few days later the Austro-German forces were driven back to the south side of the valley.

Meanwhile the Cracow-Jarosław lowland had been pouring a steady stream of munitions into the Jarosław region. With these accumulated stores at their command, overwhelming superiority in artillery fire again favored the Teutons. Better means of crossing the San barrier must also have been constructed, since the troops which had reached the east bank during the first assault in May held a narrow strip of country there and so protected the engineers at work in the valley. A new offensive found

the Russians unable longer to maintain their position in this section, and toward the end of June they retired to the Gródek line of lakes. At the same time an Austrian offensive along the Pruth drove the Russians back to their former position behind the Dniester gorge.

The Gródek barrier consists of a north-south string of lakes connected by broad belts of marsh through which rivers flow from one lake to another. Only an occasional narrow isthmus of dry land or an artificial embankment affords crossing to a railway or highway, as at Gródek and Komarno. Behind such a barrier a small body of troops could withstand the frontal attacks of vastly superior forces. But unfortunately the barrier is only 25 or 30 miles long; and while it connects with the Dniester barrier at the south, its northern end may be passed without difficulty. The Teuton armies ascending the gentle back slope of the Podolian cuesta did pass the northern end of the Gródek lakes, outflanking the Russians and forcing their further retirement. Meanwhile, although all efforts of the Austrians to cross the Dniester in force had failed, more and more of the western end of this secure position had to be abandoned as the eastward retirement of the Russians progressively uncovered the upper Dniester.

After the Russians withdrew from the Gródek line, those familiar with the topography of Galicia predicted that the next check to the Teutonic advance would occur when the north-south barrier of the marshy Bug with its braided channels was reached. The line of this stream may be regarded as prolonged to the Dniester by several of the parallel gorges descending the southern slope of the Podolian cuesta, of which the Gnila Lipa is one. Behind this trench the Russians took up their position the last of June. The Gnila Lipa trench is less easily defended, however, than that of the Zlota Lipa farther east. This latter stream rises so close to the source of the Bug as to form with it one practically continuous barrier and is characterized throughout by high and steep valley walls and in its middle course by a flat floor dotted with lakes and marshes. To this better position the Russians at the south soon withdrew, thus bringing their front into perfect alignment with their comrades farther north who had by now securely established themselves behind the marshy floodplain of the Bug (Fig. 2). Here the Teutons were held in check and the main Galician campaign ended; for the Warsaw salient was already strongly developed, and an attack upon it offered promise of greater returns than could an attempt to drive the Russians from behind so formidable a barrier as that of the Bug-ZlotaLipa-Dniester trench.

*The Warsaw Salient.* Leaving sufficient troops to hold the Russians behind the barrier just described, the Teutons turned their main forces abruptly northward to crush in the southern side of the Warsaw salient. About the same time an attack from the north drove the Russians back behind the Narew-Bohr line, and attacks against the west front caused a withdrawal to the protective screen of the Vistula. The supreme contest

of the retreat was now fully joined, the prize consisting of Warsaw and central Poland; the apex of the railway system; the stores, munitions, and guns in the forts of Warsaw, Ivangorod, Novo Georgievsk and those of the Narew-Bohr line; and, most important of all, that great section of the Russian army defending the enormous salient. If the Teutons pushing northward from the Galician border and those pushing southward from the East Prussian border could quickly squeeze the neck of this salient narrow enough, all the prize would be theirs.

A map of the Warsaw salient (Fig. 3) makes clear the geographic elements involved. Nature had provided an admirable series of physical barriers for the defense of the salient, while man had constructed an excellent railway system back of and paralleling these natural defenses. The northern arc was protected by the Bohr and Narew Rivers with their almost impassable marshes, as well as by artificial fortifications erected at intervals along the streams. The strategic importance of this physical barrier and the repeated failure of German attempts to force it have been described in earlier articles. Back of this line and supplying its defenders is that portion of the Warsaw-Petrograd railway included between Warsaw and Grodno. Between Novo Georgievsk and Józefów the western arc of the salient is defended by what has often been called the most serious military obstacle in Europe,—the deep, broad trench of the Vistula with its steep walls, flat marshy floor, and swift river of majestic volume, unfordable and seldom bridged. Parallel to it and serving its defenders runs the Warsaw-Ivangorod railway. The southern arc, from the Vistula to the Bug, has as its protective screen a marshy forest through which the most practicable means of communication consist of two narrow causeways uniting the nearest rail ends at the Galician border with Lublin and Cholm. Parallel to this front is the railway running eastward from Ivangorod through the two towns just mentioned. All of the peripheral railways are further supplied by branches radiating from the central part of the salient.

The problem of the Germans on the north was to break through the Narew-Bohr screen and push southeast across the Warsaw-Petrograd railway toward Brest-Litovsk, while their comrades on the south advanced through the marshy forest and across the Lublin-Cholm railway toward the same point. If the two wings could advance even at moderate speed, the lines of Russian retreat would be cut and the trap would close before stores, munitions, guns, and men could possibly be withdrawn to the east. Meantime the army west of the Vistula was to play the subordinate rôle of holding the Russians engaged behind that barrier until the weakening of their line by withdrawal of men should render the crossing of the stream feasible. The Russian problem was so to utilize the natural defenses as to prevent a Teutonic advance; or, failing this, to render the advance so slow that ample time would be available for the complete

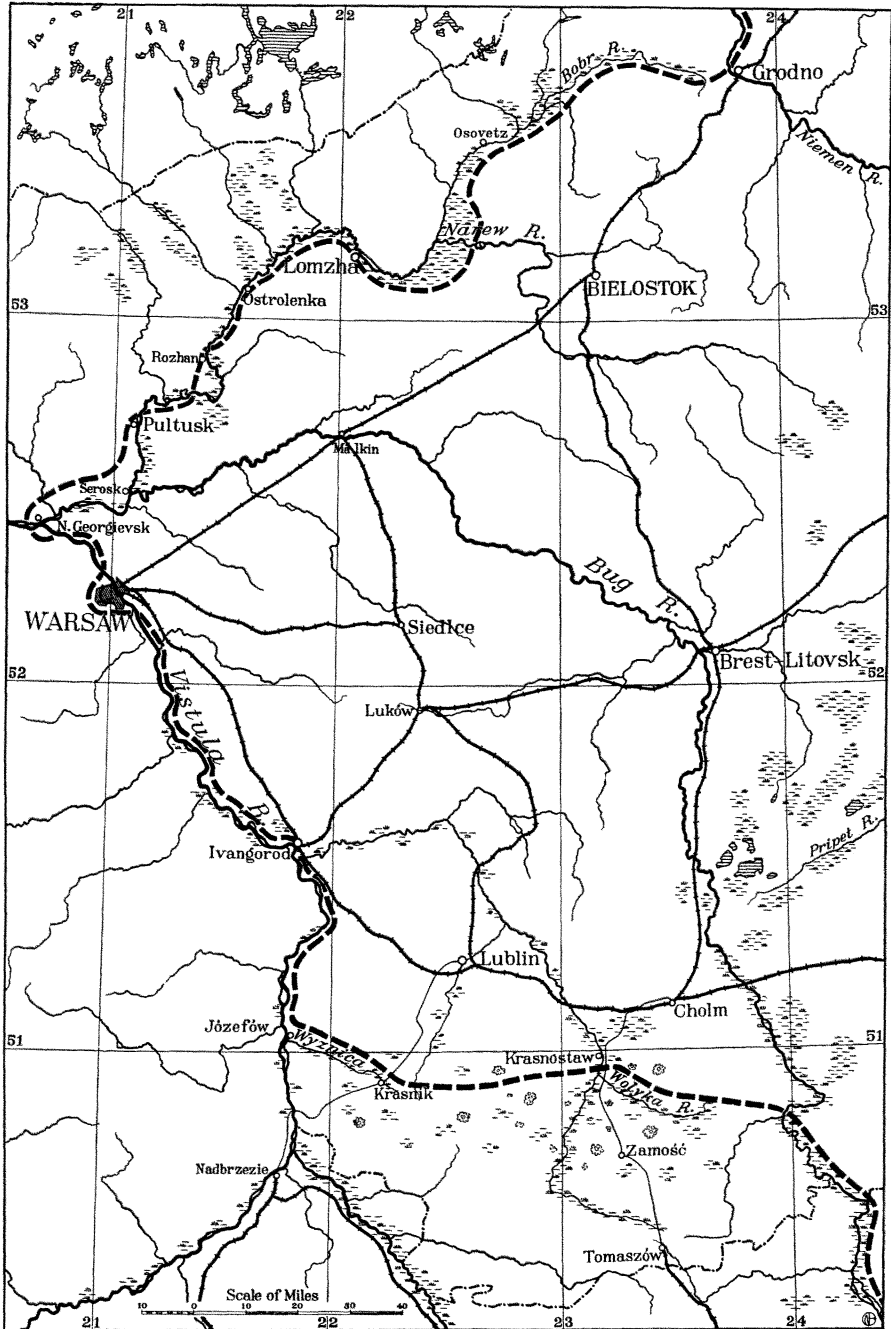


FIG. 3—The Warsaw salient. The broken line shows approximate position of the Russian front. Scale, 1:2,300,000.

evacuation of Warsaw, Ivangorod, and other fortified places, and the withdrawal of the main body of troops before the railways to the east should be cut.

The advance on Lublin and Cholm was undertaken by an Austrian army moving along the Krasnik causeway and a German army moving along the Zamość causeway, both armies being supplied from the railway termini near the Galician border. (The causeways are indicated by hair-lines on Figure 3.) At Krasnik the Austrians encountered the Russians lined up back of the marshy valley of the Wyznica River. Frontal attacks against this barrier seem to have been unsuccessful; but it appears that farther east the Austrians were able to advance around the head of the river where the ground was dryer and so to flank the Russians out of their defensive position. Progress was extremely slow, however, the defense of the narrow causeway in a marshy forest being overcome only with the greatest difficulty.

Similar difficulties were encountered by the German army when they found their advance along the Zamość causeway contested by Russian forces entrenched behind the marshy barrier of the Wolyka River, just south of the town of Krasnostaw. A fierce battle was fought before the Germans were able to dislodge the enemy from his position of advantage and capture the town. The average rate of advance along the causeways for both Austrian and German forces was less than a mile a day. At this rate the southern jaw of the trap would never close in time to catch the Russian bear. The supply of artillery and munitions from distant bases by means of the two congested causeways traversing difficult country was far too slow to render the southern armies capable of striking quick, effective blows. It became evident that dependence for Teutonic success must be placed in the northern armies under von Hindenburg. Although the southern armies were within ten miles of Lublin and Cholm on July 18, it was not until the end of the month that they reached the railway and cut one line of Russian retreat.

For the purpose of smashing through the Narew-Bohr line von Hindenburg, who knew from painful experience the difficulty of the task, had at his disposal an enormous army, fully equipped and plentifully supplied with accumulated stores of ammunition. The attack began about the middle of July. In the course of a week or ten days small bodies of German troops succeeded in breaking through the barrier at isolated points but were unable to press these slight gains. Two weeks more of hard fighting failed to secure an average gain of half a mile a day at any point. About August 1 the Russians began the evacuation of Warsaw and Ivangorod in an orderly manner. The forts were dismantled, the stores and big guns shipped east by rail, and everything of military value removed or destroyed. Meanwhile the Teutons had succeeded in crossing the Vistula in force above Ivangorod. With a thin screen of rearguard troops holding

the defensive lines, the bulk of the Russian army was now transferred eastward to its new position. One of the most brilliant retreats in military history was thus accomplished, because the physiographic character of the Narew-Bohr line enabled the Russian rearguard to hold at bay vastly superior forces under the redoubtable von Hindenburg and so retard their movements that more than a month of furious fighting netted them an advance of less than twenty miles. It was near the middle of August when the Russian rearguard began to retire, and the Teutonic forces were allowed to close the empty trap.

Novo Georgievsk forms an exception to the rule that the Russians removed men, guns, and munitions from their forts before retiring; for here the forts remained intact and a considerable body of troops was left to garrison them. Since there was ample time to evacuate these forts as perfectly as were those at Warsaw and Ivangorod, it may be wondered why guns and men were left to the certain fate of ultimate capture. The explanation of the mystery is geographical. In an earlier article I emphasized the fact that while the Vistula was a formidable barrier to an attacking enemy, it was an admirable supply line for the forces which controlled it. As soon as the Warsaw salient should be evacuated this supply line would become available to the Teutonic forces following the retreating enemy, and boats pushing southward up the river to deliver stores and munitions all along the rear of the eastward moving armies would enormously facilitate a vigorous offensive. This could be prevented, however, so long as the guns of Novo Georgievsk kept the barges of ammunition and other supplies assembled in the lower Vistula from ascending the stream. Hence the sacrifice of men and guns to delay for two weeks the Teutonic use of the middle Vistula.

*The Grodno Salient.* In the continued eastward retreat of the Russians following their escape from the Warsaw salient, there was developed, early in September, an important salient with the fortress of Grodno at the apex. Reference to a map (Fig. 8) showing the approximate position of the Russian forces at this time will make clear the striking resemblance between the smaller salient and its greater prototype about Warsaw. Let Grodno stand for Warsaw, the Niemen-Meretchanka barrier for that of the Narew-Bohr, the Niemen from Grodno to Mosty for the Vistula, the Rossa River for the north-south segments of the upper Bug, and the strategic relations will be apparent without detailed discussion of them. Even the railway lines occupy strikingly similar positions within the salient; and the most important difference in the two cases is that the south side of the Grodno salient is not prolonged as far eastward as in the Warsaw case, the Russian line turning south along the Rossa instead of continuing eastward to follow the Shchारा, which would have made a better equivalent of the Bug.

The task which confronted the Teutons was to cross the barrier of the





FIG. 4.



FIG. 5.

FIG. 4—Bridge over the Vistula at Warsaw, destroyed by the Russians before their retreat. The view shows Austrian and German engineers restoring communication across the broad barrier formed by the great river. (Photo copyright by Underwood & Underwood.)

FIG. 5—Russian trenches along sloping east wall of the broad and deep natural trench cut by the Niemen River. The Russian soldiers are in the act of repelling a German attempt to cross the barrier. (Photo copyright by Underwood & Underwood.)

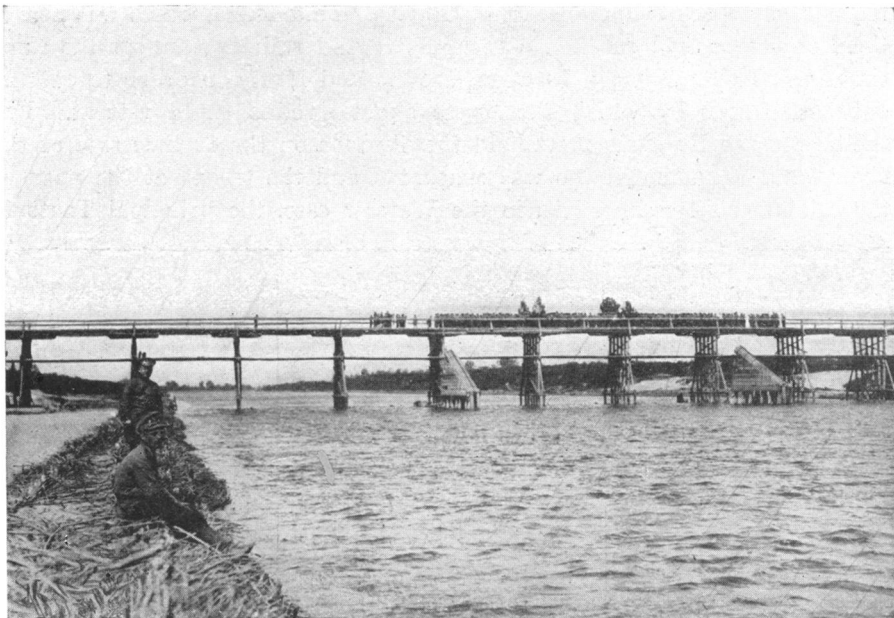


FIG. 6.



FIG. 7.

FIG. 6—Temporary bridge built to establish communications across the barrier of the San River. (Photo copyright by Underwood & Underwood.)

FIG. 7—Part of the Russian fortifications at Rozhan reinforcing the natural barrier formed by the broad, marshy floor of the Narew valley, visible in the distance. (Photo copyright by Underwood & Underwood.)

Niemen north of Grodno or, better still, the Meretchanka, which was nearer their objective, and cut the Warsaw-Petrograd railway; and at the same time to cross the Niemen between Grodno and Mosty in order to cut the only other line by which the forces about Grodno could retreat. For their part the Russians must hold the Teutons on the farther side of the river barriers until Grodno was evacuated and the troops at the apex of the salient could escape. As in the Warsaw case, the principal Teutonic

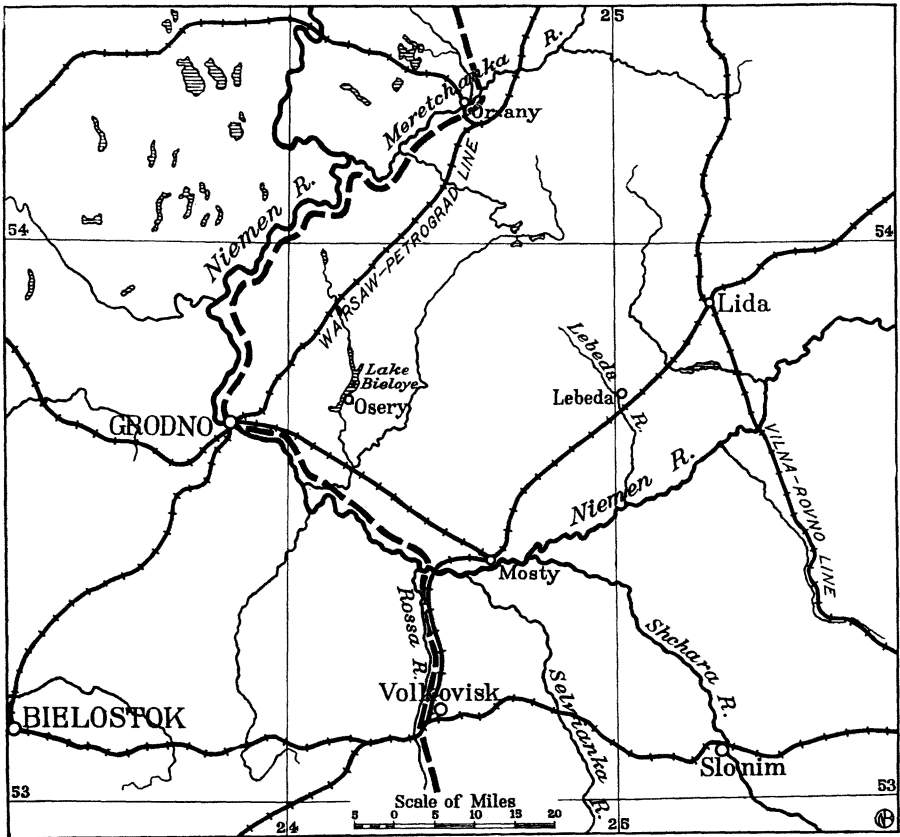


FIG. 8—Approximate position of the Russian front (broken line) at the Grodno salient. Scale, 1:1,500,000.

attack seems to have been directed from the northwest; but unlike the larger example, it would appear that Grodno fell as the result of direct assault about the first of September. To crush in the apex of a salient is, however, to achieve a comparatively small result. The railways back of the barriers must be reached and cut if the retiring army is to be destroyed. A week after the fall of Grodno the Germans were still battling vainly to cross the Meretchanka on the north and the Rossa and Niemen on the south. Aided by topographic obstacles the Russians were able to make good their escape. When the Grodno trap closed it, too, was empty.

A few days later the Russians behind the Rossa fell back to the east bank of the Selvianka, where the Teutons advancing along the Bielostok-Slonim railway were held at bay for some time and compelled to fight a hard battle for the rail-crossing over the river. A further retirement to the line of the Shchegara was then effected, the troops of the salient having meanwhile retired to the Lebeda line.

*The Vilna Salient.* Before the fate of the Grodno salient had been fully settled, or about the beginning of the second week in September, the development of the Vilna salient began. Retreat from Vilna could be effected by three railways: northeastward toward Dvinsk by the Warsaw-

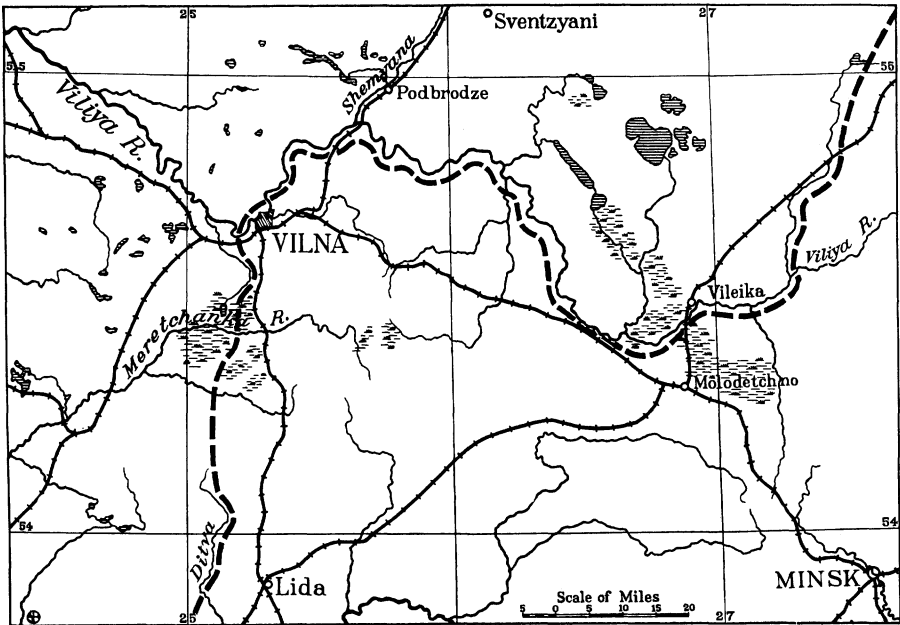


FIG. 9—Position of the Russian front (broken line) when the Vilna salient was most strongly developed. Scale, 1:1,850,000.

Petrograd line, here defended first by the Viliya River and later by the much smaller Shemyana, which runs parallel to and west of the railway for 35 miles; southeastward by the Vilna-Minsk line, protected on the north by the Viliya River and a series of lakes and marshes; and southward through Lida by the great north-south Vilna-Rovno line described in the early part of the present paper, which, in this region, is protected by several small streams and marshes between Vilna and Lida and farther south by the Lebeda and Shchegara.

When the Russian line, pressed by the pursuing Teutons, took up its position along the Viliya and Shemyana Rivers, a very slight salient was created with Vilna as the apex. Heavy assaults intended to break through the barrier and cut the railway immediately behind it achieved success

about September 12, when German troops crossed the Shemyana near Sventzyani and severed communications between Vilna and Dvinsk. It is worthy of note that the assaults were successful where the smaller river formed the railway's only protection. The Russian troops now fell back to the south behind the more formidable barrier of the Viliya in order to protect the Vilna-Minsk line; and for days the despatches recorded the furious attempts of the Teutons to secure "the fords of the Viliya." German cavalry moving rapidly southeast reached Vileika September 17. The Vilna salient was now developed in its most acute form, the position of the Russian front at this time being roughly as represented in Figure 9.

About the same time that Vileika was captured the Germans forced a passage at the fords of the Viliya north of Vilna, thus breaking through near the apex of the salient, and likewise forced a passage of the Shchara south of Slonim (Fig. 8), thereby rendering retreat southward by the Vilna-Rovno line dangerous. There remained another avenue of escape, the Vilna-Minsk railway; but this was temporarily closed about September 18 when by a rapid dash over the Viliya German forces reached the vicinity of Molodetchno junction and seriously threatened the main line at that point. The same day German troops entered Vilna.

A great body of Russian troops was now caught in the Vilna salient, and every avenue of escape seemed in German control. Berlin rejoiced at the first success of the Teuton armies in closing one of the famous salients with a large prize inside. But the joy was premature. Truly the trap had closed; but its jaws were too weak for the size of the bear it had caught. The inadequate German forces at Molodetchno were hurled back across the Viliya, the defensive line re-established, the railway opened, and the Russian armies and their equipment safely removed to a new front farther east.

*The Riga-Dvinsk Campaign.* While the operations about Grodno and Vilna were still in progress, the extreme left of the Teutonic line was attacking the region of the lower Dvina River. About August 1 the important railway center of Mitau was taken by the Germans, and the campaign for the possession of Riga and Dvinsk begun. Before long the ablest German generals and their best seasoned troops were here engaged in some of the most furious fighting of the war. For more than five months first Riga and then Dvinsk have been subjected alternately to desperate assaults which have cost the Germans an unbelievable toll in killed and wounded and have gained them nothing. A naval battle for control of the Gulf of Riga formed part of the operations directed against the two cities, which have appeared more prominently than any others in the war despatches ever since last summer.

The accompanying map (Fig. 12) gives the geographic answer to the question, "Why have the numerous German offensives against Riga and Dvinsk failed?" Between these two cities runs the northern segment of

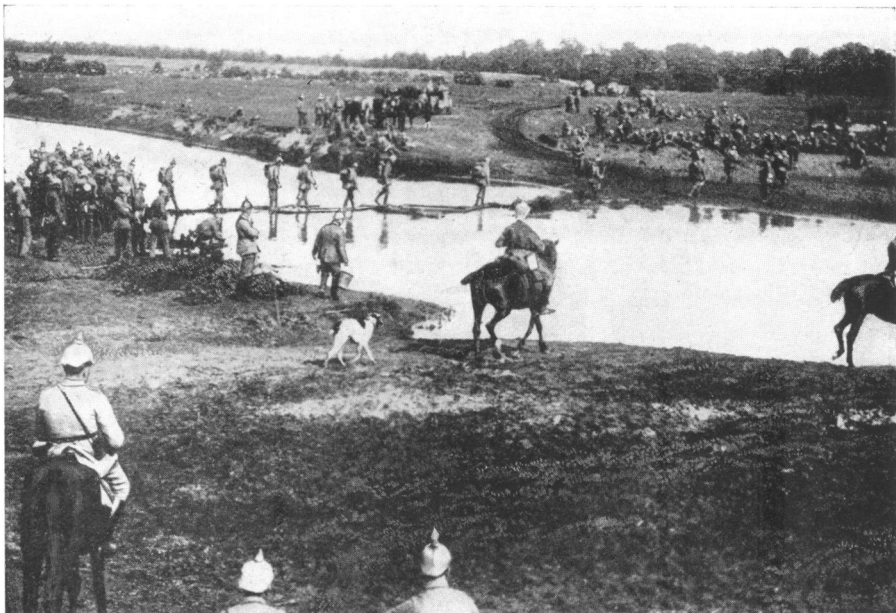


FIG. 10.



FIG. 11.

FIG. 10—German troops crossing the Selvianka River in single file on a temporary bridge of logs. The difficulty of forcing even so small an obstacle as this narrow stream, under enemy fire, is obvious. (Photo copyright by Underwood & Underwood.)

FIG. 11—Fording a river with field artillery. Many horses are required for each gun, and all guns must be protected from moisture by waterproof coverings. A small stream may thus seriously delay an advancing army. (Photo copyright by Underwood & Underwood.)

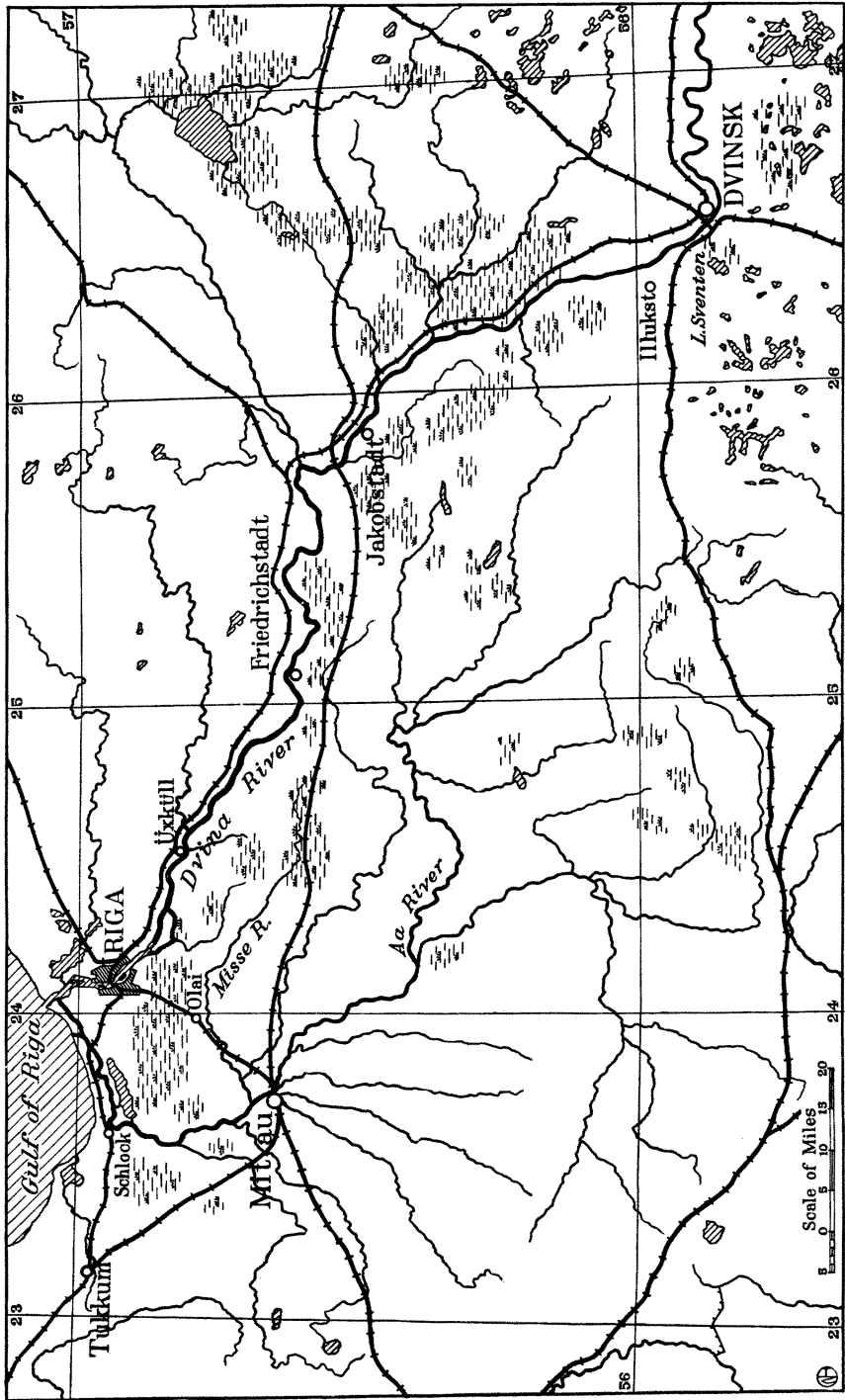


Fig. 12—Natural barriers of the Riga-Dvinsk region. Scale, 1:1,500,000.

the north-south railway system previously described as essential to the Germans if they were to establish themselves on a satisfactory winter line in the east. Parallel to the railway, and protecting it on the southwest, is the broad, deep current of the Dvina River. Southwest of the river is a belt of marsh which adds materially to the defensive strength of the natural barrier. With but few exceptions the marshland is devoid of roads and practically impassable for troops,—wholly so for heavy artillery. At its northwestern end this topographic barrier is protected from a flank attack by the Gulf of Riga and the lower course of the Aa River; at the southeast similar protection is afforded by the belt of lakes and marshes south of Dvinsk, forming the continuation of the morainic belt of East Prussia, and by the east-west course of the Dvina River. Seldom has a strategic railway been more securely situated behind natural fortifications.

We may divide the campaign for the Riga-Dvinsk line into three parts: first and most important of all, the operations against Riga with the object of turning the right of the Russian defensive line; second, the attempts to break the line at Friedrichstadt and elsewhere by frontal attacks; and third, the efforts to capture Dvinsk and thus turn the left of the forces behind the river. The assaults against Riga began with an advance from Mitau along the Mitau-Riga railway, early in August. About halfway between these two points is the small town of Olai, important to us because it marks the place where repeated German attacks have ended in failure. Immediately north of Olai is the great Tirul marsh; just south is the Misse River flowing through a marshy forest. One German assault after another has failed to penetrate one or both of these topographical barriers, and the name Olai has thus come to be associated with costly Teutonic defeats with which the town and its artificial defenses had little or nothing to do. German successes in the east have usually been achieved through the effective use of very heavy artillery in battering down the resistance of the lighter Russian guns. Wherever marshes have restricted the use of heavy artillery to the narrow front offered by a railway embankment or causeway through the wet country, Teuton and Slav have met on more equal terms, and the Teuton offensive has languished.

After several weeks of costly but unsuccessful assaults against the marshy barrier from the south, the Germans shifted their forces to the west and attacked from the direction of Tuksum. In reports of this fighting the town of Schlock has figured prominently, for reasons readily apparent from the map. The lower Aa River makes an effective north-south barrier which has its northern end at Schlock. Here the river turns east and flows parallel to the gulf coast for many miles, as if deflected from its normal course by a broad sandbar deposited under the influence of an eastward moving current in the gulf. South of the deflected river and increasing its value as a barrier is a long narrow lake known as Lake



Babit. The Tukku-Riga railway follows the bar between river and gulf for some miles before crossing the river on its way to Riga. It appears, therefore, that the north-south segment of the Aa River, reinforced on the east by the Tirul marsh, interposes an impassable barrier to any advance south of Schlock; while the logical route along the railway would compel the attacking forces to advance in column on a narrow ridge of land flanked on both sides by bodies of water from which or across which Russian guns could direct a deadly flanking fire. Topographic conditions would seem to render impossible any hope of a successful attack against Riga from the west; yet the Germans struggled fiercely to capture the city from this direction. The name of Schlock is naturally associated with their failure to penetrate the physical barriers near that town. The naval engagement for control of the Gulf of Riga seems to have ended in favor of the Russians and thus to have assured to their right flank the protection of the sea.

In attempting to break through the Dvina river and marsh barrier the Germans succeeded in capturing Friedrichstadt near the center of the line early in September and may even have thrown some troops over the river to the north bank. This degree of success was favored by the parallel railway close to the river on the south, from which one of the few roads through the marsh connects with the town. But the consummation of the success thus begun was rendered impossible because of the obstacles presented by both river and marsh to an advance with front sufficiently broad to make the crossing of the river effective; and because the country north of the river is a marshy forest, largely devoid of roads, through which the troops which may have crossed could make but little progress. The railway last mentioned bridges the Dvina near Jakobstadt, and the Germans were thus aided in an attack near that town which brought them close to the river, but apparently not to its northern bank. Near Üxkü several islands in the river afford opportunity for a crossing which would further be aided by the fact that small streams from the south provide facilities for constructing pontoons in safety behind the German lines and floating them down into the main river in the shelter of the islands. A heavy bombardment of Üxkü led the Russians to anticipate a crossing here, but apparently it was never effected, the unfavorable topographic elements more than counterbalancing those favorable to such an operation.

The campaign against Dvinsk has failed because of the inability of the Germans to get past the lakes, marshes, and streams guarding the south-eastern end of the Riga-Dvinsk barrier. Dvinsk is protected in the first instance by a great bend in the Dvina River which forms a natural moat on all sides but the north. Beyond the river to the west and south lie the marshes and lakes often mentioned in the despatches. Lake Sventen to the west, with its associated marshy forest, has in particular proven a formidable obstacle to many attacks; while the marsh to the southeast checked a flank attack from that quarter. The losses suffered by the Germans in

their frequent attempts to storm the passes between the lakes have been most serious. Indeed, the terrific but fruitless assaults against the natural fortifications of the whole Riga-Dvinsk region, covering a period of more than five months, have created appalling casualty lists and materially weakened the chances of the Germans to conduct successful offensive movements in the future. A similar weakening for a similar cause has been apparent at the southern end of the eastern front, where the Austrians and Germans who had recently pushed their offensive to the Goryn and Sereth Rivers were later thrown back to the line of the Styr and Strypa, with heavy losses in prisoners as well as in killed and wounded. On the other hand the Russian armies, protected by the troops lined up back of the Dvina-Pripet-Styr-Strypa barrier, have secured an opportunity to reform their shattered forces, equip another group from their almost limitless supply of fighting men, and so confront their enemies in a few months, as strong or stronger than they were in April, 1915, when the great retreat began.